

# NASA SBIR/STTR Technologies

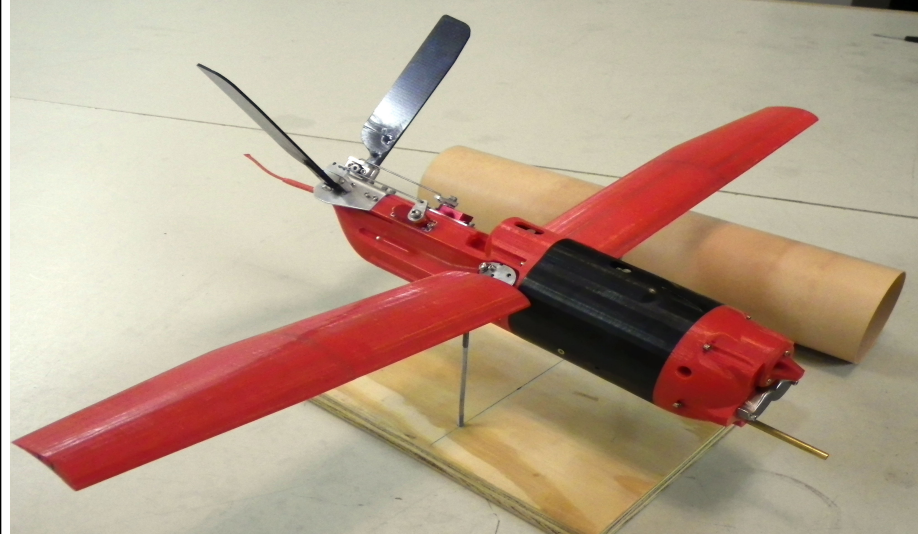
## S3.05-8263 - Navsonde Atmospheric Sampler



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### Identification and Significance of Innovation

Remote ash-cloud sensing technologies have expressed a need for validation, highlighted by recent eruptions in Iceland (2010) and Chile (2011). Latitude is addressing this need with the the NavSonde, a low-cost, retrievable and reusable, autonomously guided dropsonde capable of in-situ atmospheric ash sample collection. The sensor may be released at high altitude by manned or unmanned aircraft stationed a safe distance from the potential ash plume. The NavSonde will guide itself to the targets area, collect samples, and land in a designation area for sample collection. Launch with weather balloons presents another low-cost method of positioning the NavSonde.



Estimated TRL at beginning and end of contract: ( Begin: 5 End: 8 )

### Technical Objectives and Work Plan

The NavSonde is designed to be deployed from existing launch tubes for the AVAPS sized dropsonde. In Phase I, the NavSonde was designed and prototyped, including deployable surfaces and a three-stage sampler. Two test flights were made, with the second achieving controlled flight. The Phase II effort includes refinement of the sampler, with characterization in a wind tunnel; design changes for better strength, for better glide slope, and to meet requirements for LRIP production; software development to provide for automatic control of the sample collection system; integration with NASA's DC-8; and several flight tests using manned aircraft and balloon launches.

### NASA Applications

Latitude's proposal directly addresses NASA's requirements under the 9.1.3 Science subtopics S1.08 Airborne Measurement Systems and S3.05 Unmanned Aircraft and Sounding Rocket Technologies. Particle and aerosol collection systems suitable for small class UAVs and dropsondes are not readily available and in many cases, researchers develop their own samplers and sensors for atmospheric research.

### Non-NASA Applications

The NavSondes greatest potential is in providing timely qualitative information to decision makers in the wake of events such as the eruption of Eyjafjallaj?kull in 2010, which was estimated to have a USD\$5B negative impact on Europe's economy. Groups as diverse as universities, DOE and the Volcanic Ash Advisory Centers have directly expressed interest in using the NavSonde to further their goals.

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**NON-PROPRIETARY DATA**